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UNITED STATES PATENT APPLICATION

OF

MYONG GI JANG

FOR

LCD SHIELD COVER

LONG ALDRIDGE & NORMAN, LLP
701 PENNSYLVANIA AVENUE, N.W.
SUITE 600
WASHINGTON, D.C. 20004
TEL: 202/624-1200
FAX: 202/624-1298

[0001] This application claims the benefit of Korean Patent Application No. 2001-30835, filed on June 1, 2001, the entirety of which is hereby incorporated by reference for all purposes as if fully set forth herein.

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BACKGROUND OF THE INVENTION

Field of the Invention

[0002] The present invention relates to a liquid crystal display, and more particularly, to a shield cover on a top surface of a printed circuit board (PCB) fitted to a rear surface of a liquid crystal display (LCD).

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Background of the Related Art

[0003] The use of an LCD fitted inside the system housing of a portable computer, a monitor, or the like, has increased substantially. This increase in use can be attributed to the fact that the LCD is thin and light in weight, viewing it is less straining to the eyes as compared to cathode ray tubes (CRT) and it has almost no harmful emission of electromagnetic waves.

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[0004] Typically, the use of an LCD is accomplished by providing an LCD module having a back light part for providing light, a liquid crystal panel part (or display part) fitted on a front surface of the back light part for receiving the light from the back light part in order to present a picture, and a case for the LCD module.

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[0005] Referring to FIG. 1, a rear part of the LCD 100 includes a printed circuit board (PCB) 10 having a circuit 1 for driving the display module, a module connector 2 for connecting a board connector (not shown) of the system, and a variable resistor 3 for adjusting a common voltage (Vcom) to optimize flickering of picture. The PCB 10 is

electrically connected to the liquid crystal panel part (not shown) by TCP (Tape Carrier Package) 20.

[0006] Referring to FIG. 2, the LCD 100 is also built in a system housing 210 of a portable computer 200. As shown in Fig. 1, there is a shield cover 30 throughout a top surface of the PCB 10 for shielding contact with the system housing 210. The use of the shield cover 30 prevents the occurrence of defective circuits, such as shorts and the like, caused by direct contact of the PCB 10 with the system housing 210 especially, for example, when the system housing is made of magnesium for the protection from electro magnetic interference (EMI).

[0007] However, the related art LCD shield cover 30 has the following problems.

[0008] Once fabrication of the LCD 100 is completed by assembling the display module, PCB 10, and the shield cover 30 with the case 40, testing procedures are done to verify the picture displays properly, for example, testing the picture to ensure no flickering is present. If the picture flickers due to incorrect setting of a common voltage (Vcom) to the LCD panel part the worker testing the LCD 100 must disassemble the shield cover 30 from the case 40 in order to adjust the variable resistor 3 thereby adjusting the common voltage (Vcom) to the LCD. In addition, disassembling the shield cover 30 from the case 40 is also required when the LCD 100 is repaired for other reasons. However, the disassembling has a number of disadvantages. For example, it requires additional expense, time, and generally is not a desirable process.

SUMMARY OF THE INVENTION

[0009] The present invention is directed to an LCD shield cover that substantially eliminates one or more of the problems due to limitations and disadvantages of the related art.

[0010] An advantage of the present invention is to provide an LCD shield cover which can, not only prevent defective circuits, but also improve workability during testing or repair and testing, and in repair permit an easy use of a module connector of a PCB.

[0011] Additional features and advantages of the invention will be set forth in the
5 description which follows, and in part will be apparent from the description, or may be learned by practice of the invention. The objectives and other advantages of the invention will be realized and attained by the structure particularly pointed out in the written description and claims hereof as well as the appended drawings.

[0012] To achieve these and other advantages and in accordance with the purpose of
10 the present invention, as embodied and broadly described, the shield cover for an LCD, having a PCB fitted to a rear surface of a display module, a shield cover on a top surface of the PCB for shielding the PCB, the PCB having a circuit for driving the display module, a module connector connected to a board connector of the system, and a variable resistor (VR) for optimizing flickering by adjusting a common voltage (Vcom), the shield cover, includes a
15 covering structure in the shield cover at a position over the variable resistor, for adjusting the common voltage.

[0013] It is to be understood that both the foregoing general description and the following detailed description are exemplary and explanatory and are intended to provide further explanation of the invention as claimed.

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BRIEF DESCRIPTION OF THE DRAWINGS

[0014] The accompanying drawings, which are included to provide a further understanding of the invention and are incorporated in and constitute a part of this specification, illustrate embodiments of the invention and together with the description serve

to explain the principles of the invention.

[0015] In the drawings:

[0016] FIG. 1 illustrates a rear view of a related art LCD with shield cover;

[0017] FIG. 2 illustrates a perspective view of a related art portable computer with an
5 LCD;

[0018] FIG. 3 illustrates a rear view of a LCD with shield cover in accordance with an
embodiment of the present invention;

[0019] FIG. 4 illustrates a section across line I-I in FIG. 3; and

[0020] FIG. 5 illustrates a section across line II-II in FIG. 3.

DETAILED DESCRIPTION OF THE ILLUSTRATED EMBODIMENT

[0021] Reference will now be made in detail to an embodiment of the present
invention, an example of which is illustrated in the accompanying drawings.

[0022] Referring to FIG. 3, the LCD shield cover of the present invention includes a
15 covering structure in the shield cover at a position over a variable resistor (VR) 3. The LCD
has a printed circuit board (PCB) 10 fitted to a rear surface of a display module, and a shield
cover 30 on a top surface of the PCB for shielding the PCB 10. The PCB has a circuit 1 for
driving the display module, a module connector 2 connected to a board connector (220 in FIG.
5) of the system (200 in FIG. 2), and a VR 3 for optimizing flickering by adjusting a common
20 voltage.

[0023] Referring to FIGS. 3 and 4, the shield cover 30 has a flap or opening 31
roughly around the variable resistor 3. The opening can have a shape of an “U” or a “TT” in
the shield cover 30. The flap can be opened and closed in the up/down i.e., vertical, direction
to allow access to the VR3, as shown in FIG. 4. Referring to the inset of FIG. 3 the flap

31 may have a chamfered portion 31a to aid ergonomically in the handling of the flap 31.

[0024] Referring to FIGS. 3 and 5, the LCD shield cover 30 has a deformable portion at the modular connector 2 so that a board connector 220 inserted into the modular connector 2 can be inserted or removed through the shield cover 30. For example, the LCD shield
5 cover 30 has a slit 32 for enabling attaching or detaching the module connector 2 to the system board connector 220, as shown in FIG. 5.

[0025] Referring to FIG. 3, the LCD shield cover 30 has a narrow slit above an end position or portion of the module connector 2. When the board connector 220 is inserted in to the module connector 2, the shield cover is displaced, and after the board connector 220 is
10 removed from the module connector 2, the shield cover returns to substantially the original position.

[0026] The functions of the opened part 31 and the slit 32 in the shield cover 30 of the present invention will be explained in more detail with reference to FIGS. 3-5.

[0027] First, when the chamfered part 31a of the flap 31, shown in FIG. 3, is lifted
15 upwardly, the flap 31 can be opened as shown in FIG. 4, this allows a user to adjust the variable resistor 3 thereby adjusting the common voltage (Vcom) in order to stop the picture from flickering. When the adjustment of the variable resistor 3 is finished, the flap 31 returns to an original position by its own elasticity, for example, as the shield cover 30 is formed of a plastic. When the flap 31 is returned to its original position, the cover over the
20 variable resistor 3 cuts off contact between the variable resistor 3 and the system housing 210.

[0028] Second, referring to FIG. 5, to insert the system board connector 220 into the module connector 2, the slit 32 is opened as the system board connector 220 depresses the shield cover 30 in the vicinity of the slit 32, as shown in FIG. 3 and 5. The system board connector is inserted in the module connector 2 through the opened slit 32. When the system

board connector 220 is pulled apart from the module connector 2, the shield cover 30 is restored to an original position by its own elasticity, thereby protecting the module connector 2.

[0029] The LCD shield cover of the present invention the following advantages.

5 [0030] The flap 31 and the slit 32 in the shield cover of an LCD of the present invention prevents occurrence of defective circuits, such as shorts and the like, improves workability and permits an easy attaching and detaching of the system board connector to and from the module connector. Also, because of its location, the shield cover in the vicinity of the slit 32 is under the system board connector when the board connector is attached or
10 detached from the module connector, as a result scratching at a rear surface of the display module can be prevented.

[0031] It will be apparent to those skilled in the art that various modifications and variations can be made in the LCD shield cover of the present invention without departing from the spirit or scope of the invention. Thus, it is intended that the present invention cover
15 the modifications and variations of this invention provided they come within the scope of the appended claims and their equivalents.